Work Plan

This section follows MDOT's PPMS in describing the Work Program. It is also consistent with FHWA's Advisory T6640.8A, the National Environmental Policy Act (NEPA) and all applicable laws, regulations and Presidential Executive Orders.

The work plan focuses on: (1) establishing an appropriate and sustainable basis for the project; (2) developing an appropriate range of alternatives; (3) coordinating the environmental and engineering efforts in a dynamic way; (4) involving the public in a meaningful way; (5) satisfying regulatory agencies; and, (6) ensuring that the process has been properly executed.

The key to a successful project is Communication! Communication! Communication! This means communicating with MDOT; with a project-related Steering Committee of local/state/federal agency representatives; with key stakeholders affected by the project; and, most importantly, communicating with the public at large. Accessibility to the project by the public builds credibility. Therefore, the use of MDOT's Web site on which all project documentation is available is essential, as is e-mail, plus a telephone hotline to provide 24/7/365 entry to the project.

Assembling a good database in an efficient manner is key to getting a project started on solid footing. Aerial photography at a very readable scale is one key data ingredient. Solid and recent information on land use, traffic, crashes, population, employment, parks, rail lines, utilities, water resources, wetlands, historic properties and other environmental issues must be assembled early and in clear graphical form. Where needed, new information must be gathered efficiently to fill voids in the database.

Computer and GIS analyses must be state-of-the-art. Output must not be gibberish but easy-to-understand by both technical reviewers and the public. Likewise, knowing how to convert traffic/travel data to practical solutions requires good communication. If a road is to be widened, giving the public a "feel" for it through video simulation is an asset. If Intelligent Transportation Systems techniques such as the Sydney Coordinated Adaptive Traffic Systems (SCATS) (and its supporting Autoscope video imaging) are proposed to optimize traffic flow, the engineer must be able to demonstrate its usefulness. And, if a solution can improve access and safety, similar solutions must be shown, or better still, sites visited so those people affected can relate to what that particular solution means to them.

Another key ingredient of a successful project is creativity. Solutions for example could include: (a) widened roads that are sensitive to the surrounding area; (b) the use of ITS; and (c) pedestrian accommodations such as overpasses of busy roads, sidewalks, etc.

Someone once said: "all politics are local." So it is with good planning/engineering; all good transportation plans are "local." Today's planning process is designed to be shared with the public so good analyses of creative solutions yield a plan the people can and will endorse.

The public/agency involvement effort will drive the project. A kickoff meeting with the MDOT Contract Administrator and Project Manager will define the final work plan, schedule, and public involvement desired by MDOT. Joint discussion will lead to decisions on the structure of a Steering Committee that will include MDOT, SEMCOG, Wayne County, the City of Detroit, the City of Dearborn, the Road Commission of Wayne County, Arbor Vista, the Big 3 automakers, railroad companies, and other local agencies. An Advisory Committee will be formed starting with community leaders, and allowing all those with an interest in the group to join. An e-mail system will be established to communicate rapidly with the Steering and Advisory Committees and the public at large.

A database mailing list will be compiled and continuously updated. A project telephone "hotline" (1/800 number) and web site will also be established to keep citizens posted on meetings and project progress. (Corradino has integrated information, including video imaging of future conditions, onto MDOT's Web site on several projects.) For each round of public meetings, media releases will be prepared for MDOT review to stimulate attendance, and graphics and handouts will be prepared to convey information to the public and to enhance discussion and promote comments. A "diary" of hotline calls, e-mails and public meeting notes will be assembled monthly for Steering Committee review.

Five rounds of public meetings are proposed. Each public involvement event will consist of a series of three meetings within 48 hours at different times and locations in/around the study area. These public meetings will be preceded by meetings with MDOT and the Steering/Advisory Committees. This structure allows most individuals with tight schedules to get to a meeting. All meetings will be handicapped accessible. All public sessions will be attended by a minimum of three Consultant representatives.

One month into the study the project will be introduced to the public, the schedule and tasks will be presented, and input on potential alternatives will be sought. The second public meeting will be held in the third month to present Illustrative Alternatives and rank evaluation factors to be used in their evaluation. At the third round of meetings in month five, the results of the Illustrative Alternatives evaluation will be presented and the Practical Alternatives will be defined. The final Practical Alternatives will be discussed and preliminary results of the technical studies will be presented in the project's eighth month. This fourth round will prepare the public to receive the formal recommendations to be presented in the project's tenth month. A final round of public meetings will be held by the end of October 2001 to present the Preferred Alternative Report. An elaboration on this public/agency involvement program is included later in this section where innovations/additions are discussed.

3.1 Task 2120 – Prepare Traffic Analysis Report

The Traffic Analysis Report (TAR) will establish vehicular patterns and volumes in the study area. Key to the analysis will be the truck traffic circulating through and serving the intermodal activity. For the intermodal facilities to function as envisioned, it will be important to understand where trucks go today and where they would prefer to go tomorrow, given the opportunity to optimize routings.

There will be clear tradeoffs between right-of-way acquisition to maximize the efficiency of truck links and neighborhood impacts. The TAR will be developed to provide the basis for future what-if scenarios and decision-making.

The first step will be to establish a horizon year and intervening years for analysis. As the intermodal facilities are developed in a staged manner, it will be important to ensure that the supporting roadway network is developed in step with other improvements. SEMCOG's traffic model now has a trip table for the year 2025, but it will be desirable to examine a shorter time frame to anticipate incremental changes.

A traffic count program that includes vehicle classification will be initiated early in the project. A classic origin-destination survey is desirable but is not readily possible nor cost-effective due to the many points of entry to and exit from the area and the fact that loads (trailers) are being dropped and picked up in great profusion. Additionally, tube counts will be made on each artery (major and minor) in the study area where information is lacking. MDOT assistance in this area is expected. And, turning movement counts will be made at all key intersections where information is lacking. The consultant understands that MDOT can provide turning movement counts for 95 percent of area intersections, but has no classification counts. Additionally, interviews with drivers, dispatchers, shipment receivers, yard managers, as well as stakeholders, will be conducted to identify patterns in commercial vehicle movement to be substantiated by the counting data. The interview process will also identify critical links in the system and how they might be improved to provide more direct access. Dispatchers will be queried regarding the magnitude of their traffic and the percentages using the primary interstate routes. Then using the aggregate data, routes to each of these will be tested.

The TAR will take into consideration the signal timing plans of Detroit and Dearborn. The growth plans of these cities, plus those of Allen Park, Melvindale, River Rouge and Wayne County, will also be reviewed.

The SEMCOG model will be used in the analysis. Corradino has used the model in-house on a number of occasions, including the Ambassador Bridge/Gateway Project. The model will be used to gain an overall perspective on travel, especially on the interstate system. But the TAR will have to provide more detailed information than produced by the SEMCOG model so it will rely more heavily on the traffic counts and the application of "micro" simulations. These techniques could include:

- Intersection performance:
  - Highway Capacity Software (HCS)
  - SIGNAL 97
  - SIDRA
  - RODEL
  - PASSER III
- Arterial performance:
  - TRANSYT-7F
  - SYNCHRO
  - ART-PLAN
  - ART-TAB
  - CORSIM
  - NETSIM
- Freeway performance:
  - FREQ
  - CORSIM

Corradino has a full understanding of all these software (for example, Corradino's T. Imada is co-author of FREQ and CORSIM was used extensively on the Gateway Project). More importantly, it

knows how to manage the input data requirements and the acceptable ranges of use of each model. Likewise, managing the outputs generated is critical or else the results are difficult to interpret. So, preparing a detailed description of the input data and the assumptions made for the analyses are key to ensuring usefulness of the results. Preparing clear, concise reports (with detailed computer output placed in appendices) will permit the reviewer/decision-maker to efficiently determine what the level of service evaluations mean.

The information produced in the TAR will include Design Hour Volumes (DHV), Annual Average Daily Traffic (AADT), and KIP axle loadings, and information suitable for analyses of traffic operations at interchanges and critical intersections. This will allow design to Level of Service D or better. Impacts to I-75 and I-94 will be defined but these freeways will not be redesigned for this project. Traffic forecasts will be of sufficient scope for air quality and noise analyses. Corradino has the unique forecasting and analysis tool, know as the Design Traffic System software. It uses existing and future traffic to estimate future D and K factors for area intersections. More on the Design Traffic System software is included in the Innovations Section of the proposal.

3.2 Task 2140 – Develop Illustrative Alternatives

The first purpose of this task is to provide sufficient information to develop, refine and then evaluate alternatives. Data will be collected and managed in a manner that leverages and maximizes the resources already spent by state and local governments. GIS is an effective tool to overlay and review the relationships among these data elements in the evaluation process. This means that certain geographic and environmental data are mapped so that the potential impacts of a proposal are directly and immediately analyzed. The establishment of the database in GIS enhances the ability to adjust a proposal interactively to reduce human, cultural and environmental impacts. The following data will be mapped:

- Population and dwelling unit densities;
- Major employers;
- Parks and other major recreational amenities (potential Section 4(f)/6(f) resources);
- Industrial parks and other major business centers;
- Higher educational, religious, and medical institutions;
- Major rail lines and utilities;
- Water resources (lakes, rivers, and streams);
- Existing and planned residential developments or neighborhoods;
- Known concentrations of elderly, low-income, or minority populations (as related to Environmental Justice); and,
- Recorded historic sites.

Land use information will be identified using a variety of sources, including but not limited to:

- Aerial photography;
- County Master Plan;
- Consultation with local planners (especially in regards to Environmental Justice issues);
- Consultation with State of Michigan resource agencies; and,
- Field checks

Data on existing transportation modes will be gathered. For highways, information will be assembled on travel, road/intersection conditions, signal timings, right-of-way, ITS techniques, etc. Information

on other modes will likewise be assembled. Where critical voids exist in any of these, or the other data mentioned above, the consultant will define how to fill them in a cost-efficient manner. Once the plan is approved by MDOT, data will be collected.

With the data collected, mapped and analyzed, the TAR report plus discussions with stakeholders will allow the basis for the project (i.e., its purpose and need) to be documented in a memorandum. Like all project documents, it will be posted on the Web following MDOT and Steering Committee review. Illustrative Alternatives will then be defined to address that need. The alternatives will be developed in the context of existing planning framework: either the proposed improvements are consistent with existing planning documents or, a change will be needed. The latter may be the case where projects are not listed on SEMCOG's Transportation Improvement Program or Long-Range Plan, or where land uses are not compatible with available future land use plans.

Elements of the Illustrative Alternatives will include roadway network, rail network, truck distribution, rail yard, and rail facility components, as well as strategies for governance and finance. Both physical and operational characteristics of the alternatives will be presented. A range of alternatives will be created, reflecting various levels of integration of potential participants and different levels of resource expenditure.

Illustrative Alternatives will be narrowed through use of a Corradino screening process that will involve MDOT, the Steering Committee, Advisory Committee and the public at large. (More on this technique is included in the Innovations Section of this proposal.) In developing the database for this evaluation, each alternative's "footprint" and associated displacements and impacts on critical resources such as parks, historic structures, archaeological sites, major institutions, and the like will be accurately defined. Data will be recorded using Geographic Information System (GIS) software to provide a comprehensive platform for analysis.

Evaluation characteristics/factors will be a mix of transportation service issues and environmental and social constraints. The three groups and the Consultant will rank each of the identified factors. Once the performance measures have been weighted for each evaluation factor, the Consultant will score each alternative, and then apply the evaluation factor weightings of the various groups. This process will highlight the strengths and weaknesses of each alternative as perceived by each evaluation group. The results of the scoring process will be used to determine those alternatives that should advance, in whole or part, as Practical Alternatives.

This task will involve extensive use of graphics, including boards, aerial photographs, and engineering concept drawings for use in a public forum, as well as draft and final Illustrative Alternatives reports.

3.3 Task 2150 – Review Illustrative Alternative (MDOT and Advisory Committee)

MDOT and the Steering Committee will review the draft Illustrative Alternatives Report, allowing its finalization. This step will include gathering public input at the second round of meetings held by the end of the project's third month.

3.4 Task 2160 – Conduct Technical SEE Analysis

The Consultant will conduct an overview of social, economic and environmental effects as outlined in the RFP. The purpose is to provide sufficient depth of analysis to make sound decisions. The range of analysis will be broad, covering any category that may be a concern; particularly those that hold potential for a significant impact on the natural or human environment under the National Environmental Policy Act (NEPA). FHWA's Technical Advisory 6640.8A will offer guidance in this effort, along with Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations;" MDOT's Noise Policy, air quality conformity requirements, ASTM E1527-97 (Standard Practice for Environment Site Assessments); and work specifications related to cultural resources. The Federal Transit Administration provides guidance on rail noise analysis, and HUD has guidance on the proximity of residential land use to rail activity.

Traffic and Transportation Impacts – Obviously, transportation improvements in the project area have a substantial effect on vehicular circulation patterns and land use. Traffic volumes and patterns (bus, auto, and truck as well as pedestrian and bicycle, where relevant) associated with the proposed improvements will affect the level of transportation service. Level-of-service changes and travel time adjustments will be the subject of this analysis, together with improved safety. Improved geometrics are expected to lessen congestion and reduce crash rates. These will be estimated depending on the anticipated typical section and access control.

Considerations Relating to Bicyclists and Pedestrians – The reconstruction of roadways needs to ensure that pedestrian and bicycle movement is facilitated, not inhibited. For example, the design of freeway ramp terminals can vary widely in how well they accommodate pedestrians and bicycles. The high speeds and volumes at interchanges in particular can act as barriers to non-vehicular movement.

Recreation/Parkland – The overview will assess whether there will be any involvement with properties protected under Section 4(f) of the Department of Transportation Act of 1966.

Land Use Impacts – The direct effects of the transportation facilities on land use will be measured as well as the added impacts of development supported by expanded transportation capacity. The former translates into relocations and the number of acres of land taken by category. The proposed project's capacity, travel time, and access control will have a direct effect on the extent and kind of development that will follow. MDOT's investments must strike a balance between safety and congestion relief on one hand and the accommodation of growth on the other. "Consistency with local planning" has long been a primary concern of FHWA. Sustainable development and the transportation/land use relationship could well emerge as a principal study issue.

Social Impacts – Southwest Detroit provides housing to a diverse population, many of whom have had to live in close proximity to industrial and commercial land use activity. This measure would indicate the proposed level of social impacts and how they can best be mitigated. The character and composition of each neighborhood's population will be examined using Census, SEMCOG and other available data.

Acquisition & Relocation Impacts – Optimizing the transportation infrastructure related to the intermodal facility will require new right-of-way. The format of a Conceptual Stage Relocation Report will be followed to determine relocation impacts, including relocation options. Ultimately, there must be a demonstration that all relocations can be achieved in conformance with the Uniform Relocation

Assistance and Real Property Acquisition Policies Act of 1970, as amended. Because of the careful definition of the project, work in this area will reflect field counts of dwelling units and businesses affected.

Community Cohesion – This analysis will examine how the "footprint" of improvements could disrupt key segments of the community's social interaction or access patterns. Analysis will determine whether there are any deleterious impacts on school access, bus routes, emergency service access areas or coverage, and other forms of community interaction. The character and composition of each neighborhood's population will be examined using Census and other available socioeconomic data.

Economic Impacts – Short-term economic impacts will take the form of construction employment. Long-term the project will make the Detroit area more competitive from the standpoint of goods movement and rail more competitive relative to trucking in some markets. These effects will be measured along with tax-base effects on the cities affected in Wayne County.

Secondary Impacts – Secondary impacts are likely to be spread across all SEE categories, particularly in the land use and economic development/redevelopment areas. The object is to enhance the latter without negative consequences to land use. The analysis will differentiate among the alternatives likely secondary impacts.

Air Quality Impact – Corradino will work with SEMCOG to determine air quality impacts and the DIFT's relationship to air quality conformity. Carbon monoxide impacts with respect to the NAAQS will be determined using CAL3QHC for intersections or CALINE3 for free flow sections, using emission factors from SEMCOG.

Contaminated Sites – A Project Area Contamination Survey (PCS) and a Preliminary Site Investigation (PSI) will be prepared to determine the potential for expensive and time-consuming cleanups. The analysis will be conducted in general accordance with the ASTM guidance documents for performing Phase I and Phase II Environmental Site Assessments. The later discussion on Tasks 2810 and 2820 amplify this work. It is understood that where testing is undertaken it will occur only in publicly owned right-of-way.

Visual Impact – The proposed project will be expected to improve the visual landscape by reducing clutter and reconstructing aging street pavements and sidewalks. A general face-lift should result from the project. The opportunity will exist for unifying materials among terminals and creating a sense of whole, rather than the many disparate visual elements that exist today.

Water Quality Impacts – Water quality impacts result from surface runoff. The consultant will work with MDOT and the Michigan Department of Environmental Quality (MDEQ) to determine what, if any, measures need to be taken to mitigate potential surface water quality impacts. These will be incorporated into the design solutions.

Floodplain Impact – No floodplain impacts are anticipated. This fact will be documented in the database. Drainage will be a concern, but as an engineering issue it will be addressed in the design solutions.

Impacts on Threatened and Endangered Species – Lack of available habitat makes this a non-issue. Regulatory agencies expressed little concern, for example, when improvements were planned for the Ambassador Bridge/Gateway Project.

Cultural Resources – Commonwealth Cultural Resources Group will submit a request to the SHPO with a detailed description of the project and a proposed definition of the project's Area of Potential Effect (APE). Phase I historical and archaeological surveys will be performed. Phase II historical or archaeological work may be conducted as part of this study depending upon the results of the Phase I surveys, and the recommendations of the SHPO. All personnel directing and responsible for this work are certified by the SHPO as meeting the professional qualifications set forth in 36 CFR 61, as appropriate for the study being conducted.

Noise Impacts – The chief concern related to noise impacts is HUD's policies on HUD sponsored projects. There are established policies on how close housing should be developed in relation to rail operations. A key is the locations at which trains blow their horns at grade crossings. Housing stock proximate to the proposed intermodal facility will be examined for noise impacts from both rail traffic and increased truck traffic. Generally, noise walls are not feasible or reasonable along arterial streets. Incompatibility of truck traffic and housing is a larger land use issue. Impact areas will be identified and potential solutions advanced. The new FHWA Traffic Noise Model (TNM) software will be used here.

Energy – Guidance in FHWA Advisory 6640.8A will be followed in providing analysis of energy use.

Construction Impacts – Construction activities result primarily in short-term environmental impacts, although the long-term effects of resource consumption, disruption of substrata (groundwater or contamination), and economic losses are also possible. Short-term impacts include disruption of traffic, increased noise, localized degradation of air quality, vibration, reduced access to properties, and other less noticeable inconveniences. A conceptual maintenance of traffic plan will address these issues.

Environmental Justice – Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations" was written to protect low-income and minority populations from bearing an undue proportion of negative impacts from federally- funded projects. At issue is the continued siting of facilities, including transportation facilities, in poor and minority areas. The issue is complicated by the fact that some communities welcome appropriate facilities as a means of job development and economic opportunity. And transportation facilities frequently have less site flexibility than prisons, sewage treatment facilities and similar major facilities.

Corradino will work with SEMCOG to determine impacts here. SEMCOG has mapped low income and minority areas. New Census data will also be used. These will be compared to the study area so planners will have knowledge of existing conditions. Because Environmental Justice was an issue on the Gateway Project, and will likely be so on the DIFT, community leaders will be a party to planning decisions ala the roles of the Steering and Advisory Committees.

3.5 Task 2810 – Conduct Project Area Contamination Survey (PCS)

The assessment of contamination impacts is expected to be an important component of the project because a large portion of the project has historically supported industrial uses such as railyards, junk yards, metal recyclers and stockyards. A number of sites on the Conrail Livernois Railyard have already been identified as suspected contamination locations.

A 1999 Limited Environmental Investigation (LEI) prepared by Fishbeck, Thompson, Carr & Huber, Inc. identified 52 locations in the Conrail Livernois Railyard where activities took place or materials were stored that may have created a current environmental condition. Since 1995, eight hazardous materials incidents were reported. The LEI also identified ten leaking underground storage tank sites and two State Priority List sites that have a potential to impact the project.

A Project Area Contamination Survey (PCS) will be conducted to update the information reported in the LEI and to assess the remaining properties in the project area for the presence of environmental contamination. The primary objective of the Project Area Contamination Survey will be to determine whether further investigation or remediation with regard to hazardous materials is required. The scope of work for the PCS will consist of a review of U.S. EPA and Michigan DEQ site contamination lists and databases, review of historical records and aerial photographs, and site inspections. Corradino will review the LEI and conduct new records reviews to ensure that all properties have been assessed. Records from the local fire and health departments will also be checked and interviews will be conducted to identify potentially contaminated sites. Historic aerial photography available from SEMCOG will be used to ensure that existing uses were not preceded by other uses involving hazardous materials.

Work will be conducted by qualified Corradino personnel. Results of the hazardous material investigations will be included in a separate technical report. The report will identify and describe potentially contaminated sites within the project boundaries.

The PCS will allow MDOT to make a decision regarding conduct of further analyses in the form of Preliminary Site Investigations and/or Remedial Investigation/Feasibility Studies.

3.6 Task 2820 – Conduct Preliminary Site Investigation (PSI) for Contamination

A Preliminary Site Investigation (PSI) will be conducted at sites identified by the PCS as potentially affected by hazardous or polluting materials. The PSI involves the collection and chemical analysis of soil and/or water samples from individual sites. This type work will be conducted on publicly-owned property. Information gathered by the PCS is used to confirm the presence of surface and subsurface environmental contamination and to prepare an estimate of costs related to management or remediation of contamination.

The Brownfields Economic Redevelopment Initiative, administered by the U.S. Environmental Protection Agency, provides assistance and incentives to states, local communities, and the private sector for assessment, clean-up, and economic reuse of contaminated properties known as brownfields, which are abandoned, idled, or under-used commercial, industrial, or institutional properties. Similar incentives exist under Michigan law. Corradino has extensive experience in providing environmental consulting services for brownfields redevelopment projects and will assist MDOT in determining if sites within the project may be eligible for assistance via brownsfield initiatives. Past work with both public and private clients has proven that such projects can be managed at a reasonable cost.

The PSI will be conducted by senior Corradino personnel who are experienced in performing site investigations. Specialized services such as drilling and laboratory testing will be subcontracted to vendors pre-approved by MDOT.

3.7 Task 2320 – Conduct EPE Aerial Photography and/or Mapping

Some aerial photography is already available of the site through Wayne County (1998 data @ 1:1000 with .5 meter elevation contours). Other photography is available through SEMCOG. Available photography will be reviewed and evaluated. If additional photography is required and approved by MDOT it is proposed to use Aero-Metric to do the photogeometry, Orchard, Hiltz & McCliment will be engaged to provide control survey work, and Advanced Geomatics to lead the survey services. The following photogeometric survey work will be performed.

The project will consist of the preparation of digital terrain and ortho-photo mapping for the specified project corridor.

The basis format for the development of the digital mapping will follow the specifications for the creation of 1:1000 scale 2D digital topographic vector mapping containing .5 meter 2D contours, 3D digital terrain models, as set forth within the Michigan Department of Transportation's (MDOT) mapping specifications.

Project Area

The limit of the project has been defined on Exhibit "A".

Aerial Photography

Black and white vertical stereo aerial photography will be acquired for the project area during the appropriate leaf-off, snow-free conditions during the fall of 2000 (dependent upon weather) or spring of 2001. The area will be photographed in a manner to facilitate a distinct scale of aerial negative.

Following the completion of the photography omission the aerial film will be processed, printed and delivered in one set of 9" x 9" black and white contact prints to represent the photography.

An index of all photography shall also be provided. The index will be developed on a 7.5 minute series of quadrangle, based upon a digital raster graphic base. This index will be provided in .TIF format on compact disc.

Photogrammetric Control Surveys

Following the completion of the flight mission, the aerial photography will be reviewed and all required supplemental photo-identifiable control point locations will be selected and described. Their specific description and location will be indicated upon a second set of 9" x 9" contact prints. These prints will be used by the survey consultant during their field survey activities. The resulting coordinate positions and elevations for all supplemental photo-id locations will be adjusted and posted within the correct positions upon the second set of control prints provided for this purpose. The processed control and entire set of control prints will be further processed to yield an analytical aerotriangulation solution.

The responsibility for providing accurate horizontal and vertical control survey data will be that of the survey subconsultant. Their survey procedures will be completed in accordance with the correct survey specifications defined by MDOT for use in photogrammetric surveying.

Analytical Aerotriangulation

After receiving the field established photogrammetric control, the accuracy will be checked and these basic control networks will be extended across the project photography through the use of an analytical aerotriangulation procedure.

Digital Planimetric and Topographic File Development

A set of 2D digital map files will be developed for the project area. These files will be developed for graphic display and presentation at 1:1000 scale. The standard planimetric detail specified within the MDOT specifications will be collected when visible upon the aerial photography.

A set of digital terrain models (DTMs) will be developed to represent the project area as well. The DTMs will be developed in accordance with MDOT specifications for .5 meter contour generation. The three-dimensional DTMs will be developed upon a model basis and merged to formulate one continuous file. Using the DTMs developed above, a set of 2D contours will be processed for the project area. The value of the contours will be .5 meters.

The planimetric files, DTM data and contour sets will be delivered in .DGN format for use with MicroStation software. The data will be delivered on compact disc.

A set of monochromatic paper electrostatic check plots will also be delivered at 1:1000 scale.

3.8 Task 2330 – Collect EPE Geotechnical Data

SOMAT Engineering will conduct geotechnical investigations. They have extensive experience in the southwest Detroit area and so have immediate access to existing geotech information. Likewise they are familiar with MDOT procedures and engineering needs. They are now performing the geotechnical research for the design of the Ambassador Bridge / Gateway Project to the north of the study area.

The scope of the geotechnical work is based on the following:

- A truck-mounted drill rig will be used to perform all the borings in either existing traffic lanes on I-75, I-94 or in surface streets, or in the paved shoulders of I-75, I-94, or in existing surface street rights-of-way. The pavement will need to be cored at all locations where the soil boring will be drilled through existing pavement.

- City of Detroit and Wayne County permits will be required to drill soil borings within city and county rights-of-way. An MDOT permit will be required to drill borings in the I-75 and I-94 rights-of-way.

- No borings will be performed within railroad rights-of-way.

- Borings will mostly be performed in City side streets and will NOT require flagging operations or other elaborate traffic control.

- The team surveyor will lay out proposed boring locations and will obtain coordinates and ground elevations at as-drilled locations.

Preparatory Work

- Collect and review available soils information from project area.
- Select proposed soil boring locations.
- Arrange for underground utility clearances through the MISSDIG system.
- Obtain necessary permits from MDOT, Wayne County and City of Detroit.

Fieldwork

- Mobilize pavement coring equipment and a truck-mounted drill rig and crew to the site.
- Drill a total of 12 soil borings as follows:
  6 borings @ 125 feet = 1000 feet (for deep foundation information)
  3 borings @ 10 feet = 40 feet (for roadway evaluation)
  Total 1040 feet
- Core through the pavement using a portable coring machine. Pavement cores will be required at all nine locations.
- Obtain two Shelby tube samples from each deep boring.
- Backfill deep soil borings with grout. Backfill shallow borings with auger cuttings. Patch all borings performed in pavement areas with asphalt patch or concrete patch.
- Provide necessary traffic control consisting of cones, signs and/or lighted traffic arrows to safely perform the fieldwork. We have assumed the following for estimation purposes:
  Freeway Shoulder Closure: 2 locations
  Railroad R.O.W.: 0 locations
  City Side Streets: 7 locations.

Laboratory Testing

- Visually classify soil samples in general accordance with the Unified Soil Classification System.
- and unconfirmed compressive strength tests on representative cohesive soil samples.

Logs, Engineering and Report

- Analyze field and lab data, and prepare a geotechnical report including the following:
  - A description of the field and laboratory investigation procedures,
  - A description of the soil and groundwater conditions,
  - Logs of soil borings and soil boring location diagrams,
  - MDOT boring log plan sheets,
  - Geotechnical recommendations for pavement subgrade preparation at the proposed bridge approaches,
  - General foundation recommendations for proposed bridge foundations, including recommended foundation type, recommended bearing depths/elevations, allowable bearing pressure, and estimated total settlement. Please note that additional soil borings will be required during the design phase to obtain structure specific soils information per MDOT criteria.
  - Recommendations for abutments and wingwalls, including lateral earth pressures, backfill, compaction, and drainage,
  - Engineering fill recommendations,
  - Construction considerations relating to soil and groundwater conditions.

3.9 Task 2340 – Develop Practical Alternatives

The evaluation of Illustrative Alternatives results in a set of Practical Alternatives. After approval of the Practical Alternatives in concept by MDOT, the Consultant will develop and document a proposed design for each of them. Preliminary results of the SEE reports and information from the third public meeting will be available to provide insight into this Practical Alternatives task. Establishing viable alternatives includes determining costs, relationships to utilities, right-of-way requirements, environmental impacts, and the project development phasing and timetable. Horizontal alignment, vertical alignment, grades, structure sizes and locations, structure approaches, roadway cross sections, vertical and horizontal clearances, and construction costs will be determined. Application of Intelligent Transportation Systems (ITS) will also be examined.

To accomplish this objective the following will be conducted:

1. Limited utility investigation - Identify existing utility owners and any potential conflicts in areas of improvement or roadway realignments.

2. Existing bridge investigation - Includes field investigation to assess visual condition of bridges, review of existing plans, and review of bridge inspection reports. It does not include detailed field investigation such as measuring beam elements. It is based on the premise that existing plans are available.

3. A study level investigation of bridges including deck section, plan view and elevation.

4. Review of existing roadway geometrics, site investigation, develop roadway alternates to MDOT and AASHTO guidelines.

5. Preliminary roadway horizontal and vertical alignments and typical sections for MDOT review and public hearing displays.

The deliverables produced by this effort include preliminary plan, profile and section drawings as defined by the MDOT Project Manager as early preliminary engineering (EPE) products for proposed profile modifications and/or intersection modifications. This is not construed to be final engineering.

The draft Practical Alternatives Report will be submitted to MDOT. It will include an evaluation using weighted factors to define the performance of each alternative. Following review, the report will be expanded with any additional detail needed. A part of the review process will be the fourth public information meeting wherein the information from the Practical Alternatives Report is presented. This provides a means of getting more input from the public leading to a preferred course of action. This task will involve the extensive use of graphics. Video imaging of the study area, or elements of the alternatives (like changed intersections, improved streets, and the like) will be useful here, if MDOT so chooses. More information on this is provided in the Innovations Section of this proposal.

Comments on the Practical Alternatives received during the public involvement program will be reviewed. Further refinement of the project's design may be required. The result could be engineering work to adjust road alignments or access points. This could then affect environmental conclusions. When sufficient data are available and consensus is reached, a preferred alternative will be determined in conjunction with MDOT and the Steering Committee. It will be the best possible alternative based on preliminary engineering, environmental analysis, and public involvement.

A Preferred Alternative Report will be prepared that includes a brief description of the process that led to the selected alternative, with a focus on preliminary engineering. The report will include plan and profile sheets at half size (11x17 format) and include cost estimates on MDOT's project scoping checklist cost sheets. Representative typical sections will also be provided. The report will also address project staging and maintenance of traffic.

All maps and plan sheets will be generated in MicroStation and will be transmitted to the client on magnetic tape or discs. The files will be accompanied by reproducible mylars of the recommended alternative and an index to all files. ASCII files of all ground coordinates and elevations used shall be provided on magnetic tape or disc. The format of all files will be compatible with the MDOT Intergraph system, which uses Interactive Graphic Road Design System (IGRDS) software.

A fifth round of public meetings will be held to discuss the preferred course of action. It will be held in the project's tenth month, expected to be October 2001.

Innovations or Additions to Scope

The Consultant proposes the use of four techniques to enhance the scope of work. All are included in the cost submitted under separate cover. The techniques address:

- Public Involvement
- Evaluation Process
- Traffic Design System Software
- Additional Project Documentation

Public Involvement

Corradino's experience is that the more one can advance a project at a reasonable pace, the more satisfied everyone is with the outcome, including the public. When public meetings are held frequently, understanding can be maintained and public support increased.

Public/agency involvement is the lifeline of a project. This includes meetings with MDOT. Tied to most of the MDOT meetings would be Steering Committee/Advisory Committee meetings. Public meetings will be held every two months on average. The typical pattern for conduct of a round of meetings will be to meet with MDOT and the Steering Committee in the morning, followed by an Advisory Committee meeting held early afternoon, followed by a public meeting at one location in the study area later in the afternoon and/or early evening. For each round, three public meetings in 48 hours will be held at different times and locations to optimize input. This technique used on the Gateway Project produced large attendance throughout.

Meetings will be tied to key decision-making points throughout the duration of the project and these will be covered in task reports. For example, an initial kickoff meeting will be held with the MDOT/ Steering Committee and the public within four weeks of a project's start. That meeting will be tied to the results of the primary data collection effort and the needs assessment. Summaries of a task report covering these topics would be presented. At this point preliminary Illustrative Alternatives would also be offered to the MDOT/Steering Committee, and then the public, and each would be invited to "go to the drawing board" to mark additional alternative solutions onto a map or photo base. An Advisory Committee can begin to be assembled at this point. It should be open to anyone.

The Preliminary Illustrative Alternatives developed through the brainstorming of the first round of meetings and subsequent work will be presented at the second round of meetings. The public will be asked to (1) complete its review of the preliminary Illustrative Alternatives so they can be finalized; and, (2) rank the importance of "evaluation" categories by which to measure the performance of the alternatives. These categories may address relocations, safety, traffic service, community cohesion, air and noise impacts, economic impacts, and the like. Subsequently, the Consultant will score the Illustrative Alternatives using the ranking of evaluation categories provided by the public, its own rankings and those of the Steering and Advisory Committees. The resulting evaluation will be a quantitative determination of how each alternative performs in the eyes of each group (i.e., public, committees, consultant). Results in the past, like on the Gateway Project, have found consistency among these groups. An Illustrative Alternatives Report will then be prepared to document the results of the first-level-screening, i.e., which options are dropped and which are to be studied further. In effect, this represents what is known as a "fatal flaws" analysis but at a level of study that

virtually precludes "what if" or other challenges from unraveling months of work. More is provided on the scoring process later in this section.

After completion of the first-level screening of alternatives, the analysis of Practical Alternatives begins. The data collection task will enter its second phase by which the remaining options will undergo adjustment to become truly workable, i.e., Practical Alternatives. A report will be produced during this task. It will be the subject of another round of meetings to determine the preferred solution(s).

Based upon input to/review of the Practical Alternatives Report, a Preferred Alternative Report will be produced. It will be a composite of the earlier task reports highlighting the preferred solution(s). Plus it will define the next steps in advancing the preferred course of action. If necessary, and in keeping with NEPA, the Preferred Alternative Report will include a project "Purpose and Need" statement, a scoping packet and draft letter of invitation for a scoping meeting to be used as MDOT deems appropriate.

To ensure the public is fully aware of each round of meetings and the overall project at every step of the way, a targeted effort to engage the general public in the process will include the following:

- Web Site - All task reports will be available at this site, together with project updates, announcements of upcoming meetings, contacts, phone numbers, and a comment hotline link to an e-mail address, so individuals can get on the project mailing list or leave comments.

- E-mail Address - All questions will be responded to daily.

- 800 Number - This is a tried and true technique to allow the general public to make comments on the project and get on the mailing list.

- Database - All those interested in the study who make themselves known through meeting signup sheets, the Web site, 800 number and e-mail will be entered into the database for notification of upcoming meetings.

- Meeting Announcements - These will be posted on the web site and mailed/e-mailed to all those on the database address list. These will double as announcements of upcoming meetings supplemented by postcard reminders.

A key aspect of the communication process is going beyond public meetings to reach out to the community on its turf. To do that, Joe Corradino, proposed Consultant Project Manager, will spend much of his time in one-on-one meetings with individuals and groups, large and small. This will go a long way to dissipating cynicism and translating impossible dreams to reality. This is what Andy Zeigler, Roger Safford, Joe Corradino, and others, did on the Gateway Project. This is what Corradino does on project after project and it produces meaningful results as illustrated by these observations:

> "Citizen input is absolutely critical, but is only relevant if somebody listens to it. Corradino has done that."
>
> *The Daily Telegram*
> Adrian, Michigan, February 22, 2000
> MDOT's I-73 Feasibility Study

"The Corradino Group has done a commendable job in incorporating public opinion. ...This effort represented professional planning at its best."

The Pharos-Tribune
Logansport, Indiana, October 19, 1993
INDOT's Hoosier Heartland Corridor Study

"This is a plan (prepared by Corradino) that I am personally proud of."

City of Kalamazoo, Michigan
Vice Mayor, Hannah McKinney
Kalamazoo's Comprehensive Plan

"I remain very satisfied that the process undertaken by The Corradino Group was fair, complete, thoughtful, and responsive in its balancing of the needs of all affected."

U.S. Congressman Steve Buyer (Indiana)
INDOT's Hoosier Heartland Corridor Study

Evaluation Process

Corradino uses a community-based evaluation technique developed by one of its employees in his doctoral dissertation. It has helped build consensus for projects across the U.S. including the Grand Rapids Southbelt, Michigan Statewide Plan and the Ambassador Bridge/Gateway Project. The Gateway Project will be used as an example to describe the evaluation process.

Nine evaluation factors (Figure 3-1) were used in the evaluation of Illustrative Alternatives. The Project Steering Committee, the Advisory Group and the public attending the project meetings each ranked the importance of the nine factors, along with the Consultant (Table 3-1). The comparison of the results of the input of the groups shows that all four considered traffic, displacements and community cohesion to be the three most important factors. The least important factor as considered by all four groups was water quality impacts. This close comparison of opinions began the building of trust among participants in the project.

The Consultant then assembled the evaluation data by category (example shown on Table 3-2 on the following page). Members of the Consultant Team then studied the evaluation data and individually scored each alternative's performance on a scale of 1 to 100 with a score

How Important Are These Factors?

We want to know how important you believe the following factors are when trying to improve access to the Ambassador Bridge.

To provide us your opinion, please rank the following factors "1" through "9", with "1" indicating the factor you believe is most important and "9" indicating the factor you believe is least important. Use each number only once.

Your opinions will be used to evaluate the alternatives.

Factor	*Rank*
Displacements	_____
Community Cohesion	_____
Noise	_____
Air Quality	_____
Water Quality & Related	_____
Parks	_____
Traffic	_____
Historic/Archaeological	_____
Hazardous Materials	_____

Figure 3-1
Evaluation Factors
Weighting Form
From Ambassador Bridge/Gateway Project

Table 3-1
Ambassador Bridge/Gateway Study
Factor Ranking

	Normalized Average				Rank			
	STG	CIG	PUB	CON	STG	CIG	PUB	CON
Displacement	.1944	.1743	.1811	.1806	2	2	1	3
Community Cohesion	.1706	.1906	.1687	.2083	3	1	2	1
Noise	.1349	.1156	.1049	.1157	4	4	4	4
Air Quality	.0754	.0831	.0940	.0648	5	6	6	6
Water Quality and Related	.0397	.0358	.0556	.0370	9	9	9	9
Parks	.0595	.0814	.0938	.0833	7	7	7	5
Traffic	.2024	.1580	.1488	.1898	1	3	3	2
Historic/Archaeological	.0635	.1124	.1025	.0648	6	5	5	6
Hazardous Materials	.0595	.0489	.0607	.0556	7	8	8	8

Note: STG = Steering Committee (Number of Judges = 7)
CIG = Community Involvement Group (Number of Judges = 17)
PUB = Public (Number of Judges = 81)
CON = Consultant (Number of Judges = 6)

above 50 considered positive. Then these performance scores were combined with the weights of each of the four groups. A sample of the results is shown on Table 3-3. Again, the consistency of results among the four groups allowed alternatives to be dropped without a problem. And, those that continued were chosen because of their support of each group.

Table 3-3
Consultant's Scoring
Alternatives: Trucks Outbound from Bridge
Average Score

	Weighted Score Summary		
	TB-1	TB-2	TB-3
Steering Committee	76.59	69.67	83.47
Community Involvement Group	77.35	68.79	84.99
Public	77.53	69.23	84.73
Consultant	76.13	69.46	84.30

This type evaluation process is very straightforward and not complicated. Its simplicity allows broad participation which, in turn, engenders coalition building. Like on the Gateway Project, using this technique on the DIFT is expected to produce the same outcome—stakeholders willing to work together to create a solution that can be built.

Traffic Design System Software

Corradino has developed a Windows-based application for estimating design traffic for roadways and intersections. The program provides the planner with a suite of tools for making traffic forecasts. It produces the data needed in most design traffic reports.

While long-range planning studies usually produce estimates of daily traffic volumes on major roadways, design engineers need estimates of morning and afternoon peak hour traffic, by direction, and similar estimates of intersection turning movements. The Design Traffic System (DTS) provides a set of systematic methods for producing the detailed estimates needed by design engineers.

The DTS allows the user to refine the estimates of daily roadway traffic volumes using outputs from travel models and the results from trend analyses of historical traffic counts. Comparisons with

Table 3-2
Ambassador Bridge/Gateway Project
Evaluation Data
Alternatives: Trucks Outbound from Bridge
First-Level Screening

Performance Measures / Alternative		TB-1	TB-2	
Displacements		• 0 Residences • 0 Institutions • 3 Businesses	• 0 Residences • 2 Institutions • 8 Businesses	• 0 Residence • 0 Institution • 0 Businesse
Community Cohesion		• Concentrated truck access to I-75 at Clark Street affects local traffic on Clark and at Clark Park.	• Relocated Fort Street displaces businesses south of Fort Street. • Concentrated truck access to I-75 freeway at Clark Street affects local traffic on Clark and at Clark Park.	• Maintains e • Concentrat Clark Stree Clark and c
Noise		• 0 Residences	• 0 Residences	• 0 Residence
Air Quality		• Relative severity of impact: 4; grade change.	• Relative severity of impact: 5; grade change, longer routing, changes in access along Fort Street.	• Relative sev route to fre • Relative sev grade chan
Water Quality		• No known impact	• No known impact.	• No known i
Parks		• All southbound trucks cross Clark at west service drive creating conflicts with access to Clark Park.	• All southbound trucks cross Clark at west service drive creating conflicts with access to Clark Park.	• All southbo west service with access
Traffic	From Bridge to Interstate	• Grade on elevated Fort Street reduces throughput.	• Trucks cross Fort Street at signal to new road. • New road on a grade reduces throughput. • Longer/slower route to interstates is less attractive.	• Shortens tri trucks; othe
	From Bridge to Local	• Elevating north side of Fort Street interferes with traffic on, and crossing, Fort Street west of Bridge.	• Diversion of some traffic to new road improves flow of local traffic on Fort Street.	• No change
	From Local to Interstates or Local	• Elevating north side of Fort Street interferes with traffic on, and crossing, Fort Street west of Bridge.	• Diversion of some traffic to new road improves flow of local traffic on Fort Street.	• No change
Historic/Archaeological (degree of impact)		• Relative severity of impact: 0; due to no significant intrusion into sensitive areas.	• Relative severity of impact: 5; due to intrusion on Potawatomi burial ground.	• Relative sev to no signif sensitive ar
Hazardous Materials		• Potential conflict with 1 or 2 hazardous material sites. • Low potential change to the existing flow of hazardous materials.	• Potential conflict with several known hazardous material sites. • Slight change to the existing flow of hazardous materials.	• Potential co hazardous • Slight chan hazardous

historical counts provide a reasonableness check on the model. Additionally, the DTS provides methods for estimating traffic volumes for interim years based on "straight-line," compound, and logarithmic growth curves.

The DTS also provides a set of daily, morning peak hour and afternoon peak hour turning movements at key intersections. These estimates are based on a set of hourly turning movement counts at each intersection and estimates of future of roadway volumes for each leg of the intersection.

The DTS provides charts, tables and diagrams of traffic volumes, peak percentages and daily distribution factors for major roadways and intersections (Figure 3-2). It also provides an estimate of 18kip loadings that is needed for pavement design. The program ensures that all intersection turning movements and roadway link volumes are consistent.

Additional Project Documentation

At the outset of this project a CPM diagram will be submitted (50 copies) to define the operations/ tasks that control the assignments. The critical path will be defined clearly along with parameters such as earliest start, earliest finish, latest start, latest finish, and total float.

The Consultant will maintain a Project Record to document the reasons for the creation of both the Illustrative and Practical Alternatives.

The Consultant will prepare and submit minutes of all project-related meetings. All such documents will be delivered to MDOT no later than 14 days following the event covered.

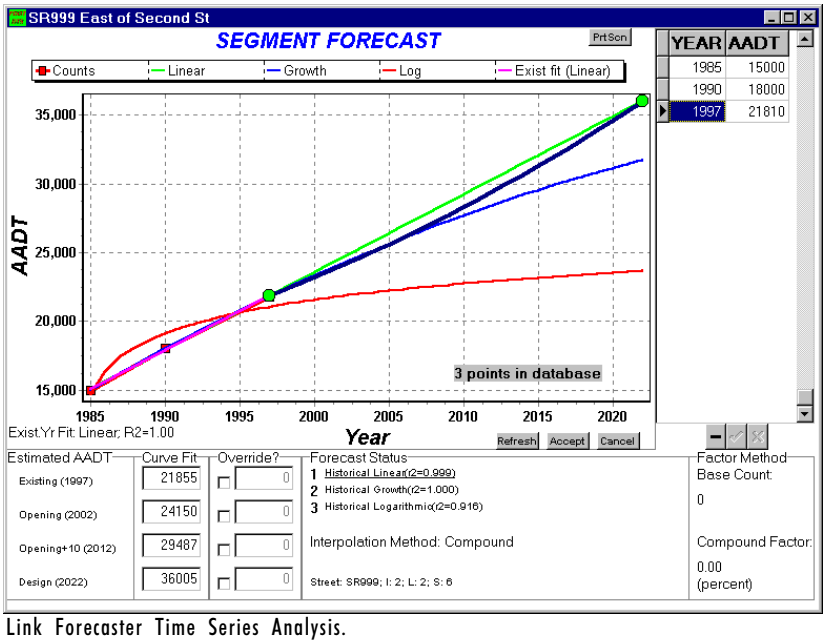
All correspondence developed by the Consultant will be coordinated with MDOT's Project Manger. The MDOT P.M. will be copied on all Consultant correspondence, including those to its subcontractors.

A Public Involvement Diary will be provided to MDOT. Likewise, an Engineering Report will be delivered to the client. It will include preliminary geometrics, right-of-way requirements, construction cost estimates, proposed staging and constructability justification for the entire project both access and terminal development elements.

Finally, the entire database, including GIS, will be electronically transferred to MDOT at the project's conclusion.

Figure 3-2
Sample Graphics from Traffic Design System Software

Corridor Display.



Link Forecaster Time Series Analysis.

Intersection Editor and Turning Volumes.

Schedule

The project has been scheduled over 10 months. It will be driven by the communication/public involvement activities. The delivery of milestone reports and the coordination of five rounds of public meetings will keep the project on track and provide an audit trail of progress and accomplishments. The use of a Web site to present information "instantaneously" to the public will enhance the project's ability to gain credibility and make progress.

The definition and evaluation of alternatives (Tasks 2140, 2150, and 2340) will regularly be "fed" information by the SEE Studies (Task 2310). Likewise these tasks will be the basis upon which the recommended course of follow-up activities (after this project is completed) is determined.

Assuming this project begins in January 2001, it will be completed by the end of October 2001. Illustrative Alternatives will be set by April 1, 2001. Their evaluation will be completed 60 days later (i.e., by the end of May 2001), at which time the Practical Alternatives will be defined. The Practical Alternatives will be evaluated by the end of August. A preferred course of action will be provided to the client by the end of October 2001.